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U.S. INSPECTED MEAT PROCESSING PLANTS

(No slaughtering)



JUN 13 1963

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A Guide to Construction, Equipment

MEAT INSPECTION DIVISION
AGRICULTURAL RESEARCH SERVICE
U. S. DEPARTMENT OF AGRICULTURE

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PREFACE

The Federal Meat Inspection program has been maintained continuously since the Meat Inspection Act was first approved in 1906. On July 1, 1960, inspection was conducted in 1,396 establishments located in 572 cities and towns. These included 535 slaughtering establishments and 861 establishments engaged in meat processing only.

During the fiscal year 1960, near 108,000,000 animals were slaughtered (approximately 80 percent of the total commercial slaughter in the United States), and 18,500,000,000* pounds of meat food products were prepared under supervision of the Federal meat inspection service.

This booklet is designed for use by meat inspection personnel, meat processing plant operators, plant architects and engineers, and others interested in control programs involving meat processing operations.

The paragraphs are numbered to facilitate reference in correspondence between the Meat Inspection Division and meat packers or their architects and engineers.

A list of specifications or notations covering meat inspection requirements not ordinarily shown in drawings themselves is included in the appendix. This list, which in some instances repeats in condensed form some of the information in the explanatory portion of the publication, is for the convenience of architects and engineers. Specifications accompanying drawings submitted for approval by the Meat Inspection Division should be selected from the list in this booklet rather than the usual builder's specifications.

Prepared in the Meat Inspection Division
Agricultural Research Service
U. S. Department of Agriculture

*This figure represents inspection pounds. Some of the products may have been inspected and recorded more than once on account of their having been subjected to more than one processing treatment, such as curing, smoking, and slicing.

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U. S. INSPECTED MEAT PROCESSING PLANTS (NO SLAUGHTERING)

A Guide to Construction, Equipment, and Layout

Introduction

Administration of Federal Meat Inspection

1. Federal meat inspection is administered by the Meat Inspection Division of the Agricultural Research Service. The administrative offices are in Washington, D. C.

Purpose of Federal Meat Inspection Act

2. The purpose of the Federal Meat Inspection Act approved March 4, 1907, is stated in the Act as—

"*** for the purpose of preventing the use in interstate or foreign commerce *** of meat and meat food products which are unsound, unhealthful, unwholesome, or otherwise unfit for human food ***"

The Act is intended to assure a healthful and wholesome meat supply in interstate and foreign commerce. The inspection maintained at a plant covers the entire production of the plant regardless of the proportion shipped in interstate or foreign trade.

Scope of Federal Meat Inspection Activities

3. The Act of 1907 applies only to cattle (including calves), sheep, swine, and goats, and the edible products derived from their carcasses. Its provisions are, however, extended to horses by the Horse-Meat Act approved July 24, 1919. The preparation, processing, and handling of horse meat must be conducted in establishments wholly separate and apart from those in which products derived from cattle, sheep, swine, and goats are prepared. Wild animals, fish, and game are not subject to provisions of the Act. Food products derived from such species are subject to State laws and local ordinances, and, if shipped in interstate or foreign commerce, are subject also to the provisions of the Food, Drug and Cosmetic Act, administered by the Food and Drug Administration of the U. S. Department of Health, Education, and Welfare. Dressed poultry and poultry products are subject to the provisions of the Poultry Products Act of August 28, 1957, if offered for sale in interstate or foreign commerce or to designated major consuming areas.

Cost of Inspection Services

4. The cost of Federal meat inspection is paid partly by the Government and partly by the packers. The Government pays the salaries of inspectors for services performed during regular hours. However, the packer is required to compensate the Government for the cost of overtime inspection. The cost of preparing, equipping, and maintaining the plant in condition to meet inspection requirements, and losses resulting from condemnation of carcasses or products must be borne by the owner or operator of the plant.

Exemption from Provisions of Meat Inspection Act

5. Under certain specific provisions of the Meat Inspection Act, retail meat dealers and farmers may make interstate shipments of meats or meat food products without operating under Federal inspection; however, the Secretary of Agriculture may, at his discretion, require that such persons apply and qualify for the inspection. The term "farmer," insofar as Federal meat inspection is concerned, is defined in the Act.

Application for Inspection Service

6. The owner or operator of any meat processing plant who contemplates engaging in interstate or foreign trade in meat or products derived from cattle (including calves), sheep, swine, goats, or horses, or furnishing such products to Federal agencies, should send detailed information relative to the nature and volume of the proposed operations to the Director, Meat Inspection Division, Agricultural Research Service, U. S. Department of Agriculture, Washington 25, D. C. In reply, he will be informed whether the proposed business requires or entitles him to Federal inspection. If so, he will be furnished a form on which he may make formal application therefor. With such application he will be required to furnish plans and specifications of the proposed plant, as hereinafter indicated. Until he receives information concerning the eligibility of the plant for the inspection, including the approval of plans and specifications, it is highly important that the applicant refrain from acquiring property, or undertaking construction, or remodeling for the contemplated operations. Failure to observe this suggestion may result in unnecessary expense and inconvenience.

Description Of Plans And Specifications That Must Accompany Application For Inspection

Submittal of Plans

1. Blueprints of drawings with specifications (in triplicate or more) that fully and clearly illustrate the applicant's plant as he proposes to have it constructed and equipped for the inspection must be submitted to the Meat Inspection Division at Washington, D. C., with the application for inspection (in duplicate). Blueprint drawings are preferred since the drawings are later converted onto microfilm records, and blueprints are most suitable for this purpose. The drawings shall include the following:

Plot Plan

2. Plot plan of the entire premises showing location of all buildings, roadways, railroad trackage, streets and alley adjoining the plant, streams, catch basins, water wells, reservoirs, and storage tanks. If nearby buildings exist on adjoining property, their height and use should be indicated. The character and surfacing of roadways, driveways, streets, and the paving of vehicular loading areas, and alleys should be indicated. The north point of the compass should be shown.

Floor Plans

3. Floor plans of each level in the various buildings showing the locations of walls, partitions, posts, doorways, windows, and other openings; floor drainage inlets and gutters; rail systems for conveying carcasses, parts, and product; chutes; location of the principal pieces of equipment; hot and cold water hose connections; and hand-washing facilities (lavatories). The slope of floors to drainage facilities should be indicated by grade lines. The location of sectional lines should be shown on the floor plans. For convenient reference, the north point should be shown on the floor plans.

Roof Plan

4. Roof plan showing skylights, vents, and other pertinent information.

Section Drawings.

5. Cross sections and longitudinal sections of the various buildings showing the character and finish of floors, walls, partitions, and ceilings; heights of ceilings; the principal pieces of equipment; and rail heights.

Elevation Drawings

6. Exterior elevations on each side of each building showing locations and sizes of doors, windows, and other openings.

Specifications or Notations

7. Specifications or notations (see pages 24-30) covering features such as source of water supply; method of sewage disposal; description of the trapping and venting of drainage lines; description of hot water system; means to dispel steam and vapor in workrooms; and screens for outer openings that would admit flies. Notations applying to the project should be typewritten on separate sheets 8" x 10½" and attached to the set of drawings, the revised sheet, or the copy sheet with attached paster drawings, as the case may be.

Size of Drawings

8. The drawings illustrating the layouts should be on sheets not larger than 30" x 42". If the size of the project is such that all pertinent information cannot be fully detailed on one sheet, two or more sheets should be used. The "cut-off" in such cases must be adequately identified with match lines with a sufficient overlap shown on each sheet to facilitate proper interpretation of the drawings.

Legibility

9. Legibility and sharp clear lines on the drawings are essential. The Washington files are maintained in the form of microfilm records only, and satisfactory film cannot be obtained from hazy drawings or those with insufficient contrast between the lines and the blueprint background. Any lettering on the drawing should be clearly distinct for reproduction on film.

Scale

10. Use of the 1/4-inch to a foot scale is preferable in preparing drawings of layouts presented for consideration. No objection will be interposed to the use of the 1/8-inch to a foot scale if in developing the layout it is found that its use is advantageous for the overall illustration of the project and that it would tend to minimize the number of sheets required for the set of blueprints; provided, that layouts of such principal departments as canning, boning, sausage, employee welfare rooms, and the like where considerable equipment or operations are

involved shall be detailed on a separate sheet at the 1/4-inch scale with a proper notation placed on the 1/8-inch scale drawings. Overall floor plans and plot plan may be developed on a smaller scale if necessary to confine them to sheets no larger than 30" x 42".

Changes and Revisions

11. The Washington office discards the original approved drawings after they have been microfilmed. Accordingly, when changes are proposed in areas for which drawings have been previously approved and converted onto microfilm records, one of the followings types of revised drawings should be submitted for review and consideration:

(a) A completely revised sheet or sheets that show the existing construction and equipment which will remain unchanged, together with the proposed alterations and/or additions (preferable method), or—

(b) A copy of the previously approved sheet or sheets with previously approved pasters affecting the area and pasters of the proposed changes superimposed and securely affixed to the affected areas in a manner not obscuring essential data.

(c) Paster drawings must be prepared to the same scale and presented on a background similar to that of the originally approved drawings to facilitate microfilming operations. When paster drawings are of a different background than the originally approved drawings, proper recording on microfilm is difficult.

Rearrangement of Operations or Activities

12. Projects for expansion or remodeling often rearrange operations or activities in existing areas or additions to the extent that previously approved overall floor layouts are misleading for use in reviewing the sequence of operations and for evaluation of inspectional requirements. In these instances, it is desired that revised overall floor layouts illustrating existing facilities, as well as the proposed changes, be made part of the expansion or remodeling projects.

Approval Stamp Space

13. It is necessary that a contrasting space (white) at least 1 3/4" x 2 1/2" in size be provided on whole sheets of blueprints for the placement of the formal mark of approval. A similar space can be affixed to paster blueprints provided the arrangement will not obliterate any features shown on the whole sheet. Otherwise, the formal mark of approval will be affixed to the reverse side of the paster drawings.

Approval of Plans and Specifications

14. If the examination of the drawings and specifications shows that they meet the requirements, the formal mark of approval is placed on them and an approved set is returned to the applicant. The other two sets are retained for reference. To avoid possible costly changes, construction should be deferred until the drawings and specifications have been approved by the Meat Inspection Division.

Use of Competent Architect or Engineer

15. Because of the specialized knowledge required to design and construct a well-arranged meat packing plant, a competent architect or engineer experienced in laying out plans for operation under Federal meat inspection should be employed to prepare the drawings and specifications. Upon request, a list of architects and engineers who have prepared plans approved by the Meat Inspection Division will be sent to any person.

Location Of Establishments

Site

1. Meat processing plants shall be located (so far as practical) in areas reasonably free of objectionable odors, smoke, flying ash, dust, etc., such as are sometimes produced by oil refineries, city dumps, chemical plants, sewage disposal plants, dyeworks, paper pulp mills, and the like.

Accessibility

2. Adequate dustproof access-ways for automobile trucks, connecting the shipping and receiving areas of the plant to the public streets or highways, shall be available. If supplies or raw materials are to be received into the plant or finished product is to be shipped from the plant by rail, consideration should be given to arranging for suitable railroad spur tracks.

Separation

3. An establishment operating under Federal meat inspection must be completely separated from any other plant and buildings, whether used for industrial, commercial, residential, or other purposes. No communication by means of doorways, windows, stairways, elevators, or passageways, loading or unloading platforms, or loading courts is permissible.

Retail Business on Premises

4. If a retail meat business is carried on within the official premises of the establishment, it shall be so arranged that customers shall have access only to the room or rooms where such business is conducted and shall be excluded from the rest of the establishment. All meat and meat food product handled in the retail business shall be U. S. inspected and passed and so identified when brought into the market.

Expansion

5. In planning a plant, consideration should be given to providing space and an arrangement of buildings that will permit future expansion. To this end, coolers, freezers, processing departments, etc., should be so located that they may be enlarged without adversely affecting other departments.

Inedible Products Departments and Grease Catch Basins

6. Features such as the inedible products departments and catch basins for grease recovery should be suitably located in the rear of the plant so as to avoid objectionable conditions affecting the preparation and handling of edible products.

Water Supply, Plant Drainage, And Sewage Disposal System

Water Supply

Potable Water Supply

1. The water supply must be ample, potable (passing the tests prescribed for potability in the "Drinking Water Standards" promulgated by the U. S. Public Health Service, Department of Health, Education, and Welfare, dated February 6, 1946, or any subsequent revision), and distributed throughout the plant under adequate pressure and in quantities sufficient for all operating

needs. Both hot and cold water must be provided, the hot water from a central heating plant of sufficient capacity or from other suitable facilities capable of furnishing an ample supply of hot water. Water from public water supply systems is usually, but not always, acceptable. If the water is supplied from private wells, the wells should be on the premises of the establishment and effectively protected from pollution. If chlorinators are required to assure a continuous potable supply, they should be the automatic type and provided with devices that inform the plant management and inspector when they have ceased to function.

Nonpotable Water Supply

2. A nonpotable water supply is a potential source of danger. If such a supply is necessary for fire protection or for the condensers of the refrigerating system, it should be kept separate from the potable supply. If a cross-connection between the two supplies is necessary, it must be one that will adequately safeguard the potable supply, and be acceptable to the Meat Inspection Division and local health authorities. Nonpotable water lines within buildings in which edible products departments are located should be avoided.

Vacuum Breakers

3. Vacuum breakers of an acceptable type should be provided on all steam lines and water lines connected to various pieces of equipment.

Plant Drainage

1. All parts of floors where wet operations are conducted shall be well drained. As a general rule, one drainage inlet should be provided for each 400 square feet of floor space. A slope of about 1/4 inch per foot to drainage inlets is required for usual conditions. In areas such as beef sales coolers and other departments where a limited amount of water is used, the slope may be about 1/8 inch a foot. It is important that the floors slope uniformly to drains with no low spots which collect liquid. Floor drains are not required in freezer rooms or dry storage areas. When floor drains are installed in rooms where the water seal in traps is likely to evaporate without replenishment, they shall be provided with suitable removable metal screw plugs.

Sanitary Drainage Lines

2. Drainage lines from toilet bowls and urinals shall not be connected with other drainage lines within the plant and may not discharge into a grease catch basin. Such lines must be installed so that if leakage develops, it will not affect product or equipment.

Size and Construction of Drainage Lines

3. Drainage lines must have an inside diameter of at least 4 inches. Drainage lines within the plant must be constructed of cast iron or galvanized metal.

Traps and Vents on Drainage Lines

4. Each floor drain must be equipped with a deep seal trap (P-, U-, or S-shape). Drainage lines must be properly vented to the outside air and be equipped with effective rodent screens.

Trunk Lines

5. Where several 4-inch drainage lines discharge into one trunk line, this line must be proportionately larger so as to handle efficiently the drainage discharged into it.

Plant Waste Disposal

1. An efficient method of disposing of plant wastes is essential. If permitted by local ordinance, plant wastes may be discharged into a municipal sewer system, and this is most desirable. If the discharge is into a stream, the flow of water must be sufficient at all seasons of the year to carry the sewage well away from the plant. If a private septic tank or sewage disposal system is used, it must be efficiently designed and operated so as not to produce objectionable conditions on or near the official premises.

Acceptance of Plant Waste System

2. The sewage disposal facilities must be acceptable to the local health authority having jurisdiction over such matters in the area. A letter from the proper health authority (State, county, city) indicating that the proposed sewage system is satisfactory must be submitted to the inspector in charge before inspection can be inaugurated at the plant.

Catch Basins for Grease Recovery

3. Catch basins for the recovery of grease shall be suitably located and not placed in or near edible products departments or areas where edible products are unloaded from or loaded onto vehicles. To facilitate ready cleaning, such basins must have inclined bottoms and should be without covers. They shall be constructed so that they can be completely emptied of their contents for cleaning, and hose connections for furnishing hot water for cleanup purposes should be provided at convenient locations near the basins. The area surrounding an outside catch basin shall be paved with impervious material, such as concrete, and provided with suitable drainage facilities. Suitable facilities, such as a blow tank, should be provided for the transfer of grease to the point of disposal after it is skimmed from the basins.

Plant Construction

Minimum Requirements

1. The building materials listed in this booklet represent minimum requirements. Variations are acceptable, provided substitutions equal or exceed minimum standards.

Materials

2. Materials used shall be impervious, easily cleanable, and resistant to wear and corrosion. Materials that are absorbent and difficult to keep clean are generally unacceptable in edible departments. Examples are wood, plasterboard, and porous acoustical-type boards.

Floors

3. Floors shall be constructed of (a) vitrified brick of good quality, bonded with acid-resistant waterproof mortar, and laid on a waterproof concrete base, or (b) dense, acid-resistant waterproof concrete. To prevent accidents, excessively smooth floors should be avoided. Good results are obtained by using brick or concrete floors with embedded abrasive particles in the surface. Concrete floors should have a wood float (rough) finish. Concrete or mortar floors that incorporate an approved latex or synthetic resin base have better than ordinary resistance to meat fats and acids.

Coves

4. Coves with radii sufficient to promote sanitation shall be installed at the juncture of floors and walls in all rooms.

Interior Walls

5. Interior walls shall be smooth and flat and constructed of impervious materials such as glazed brick, glazed tile, smooth-surfaced portland cement plaster, or other nontoxic, nonabsorbent material applied to a suitable base. Walls should be provided with suitable sanitary type bumpers to prevent damage by handtrucks, carcass shanks, and the like.

Ceilings

6. Ceilings should be of good height (10 feet or more is desirable in workrooms). So far as structural conditions permit, ceilings shall be smooth and flat. Ceilings shall be constructed of portland cement plaster, large-size cement asbestos boards with joints sealed with a flexible sealing compound, or other acceptable impervious material. If the ceiling has exposed joists, the joists must be at least 36 inches on center and so designed that there are no excessive ledges or crevices which would be difficult to keep clean.

Window Ledges

7. Window ledges shall be sloped about 45° to promote sanitation. To avoid damage to glass in windows from impact of handtrucks and similar equipment, the window sills should be 3 feet or more from the floor.

Doorways and Doors

8. Doorways through which product is transferred on rails or in handtrucks must be at least 5 feet wide, except that doors used in connection with rails approximately 11 feet high must be at least 4½ feet wide. Doors must either be of rust-resistant metal construction throughout, or if made of wood, they must be clad on both sides with rust-resistant metal having tight soldered or welded seams. Door jambs shall be clad with rust-resistant metal securely affixed so as to provide no crevices for dirt or vermin and the juncture at the walls effectively sealed with a flexible sealing compound.

Screens and Insect Control

9. All windows, doorways, and other openings that would admit flies shall be equipped with effective insect and rodent screens. "Fly chaser" fans and ducts shall be provided over doorways in outside walls of food-handling areas that are used for shipping or receiving.

Rodent Proofing

10. Except in the case of solid masonry walls constructed of glazed tile, glazed brick, and the like, expanded metal or wire, not exceeding 1/2-inch mesh, shall be embedded in walls and floors at their junction. This mesh should extend vertically and horizontally a sufficient distance to exclude the entrance of rats and other rodents.

Interior Woodwork

11. Dressed lumber shall be used for all exposed interior woodwork.

Paint

12. All exposed interior wood surfaces shall either be painted with a good grade nontoxic oil or plastic-base paint, treated with hot linseed oil or with a clear wood sealer.

Stairs

13. Stairs in edible product-handling departments shall be of impervious construction with solid treads and closed risers and shall have side curbs of similar material, 6 inches high measured at the front edge of the treads.

Plant Lighting, Ventilation, And Refrigeration

Lighting

1. Unrefrigerated workrooms shall be provided with adequate direct natural light and ventilation or ample artificial light and ventilation by mechanical means. Uncolored glass having a high transmissibility of light should be used in windows and skylights. To reduce glare, light diffusing and heat absorbing glass (blue) may be used in skylights and windows that are subjected to considerable sunshine. The glass area should approximate

one-fourth of the floor area of a workroom. This ratio should be increased where there are obstructions, such as adjacent buildings, overhead catwalks, and hoists, which interfere with the admittance of direct natural light. Well-distributed artificial lighting of good quality is required at all places where, or at times when, adequate natural light is not available or sufficient. The overall intensity of artificial illumination in workrooms should be not less than 20 foot candles. At all places where inspections are made or where special illumination is required to enable establishment employees to properly prepare products of any character to meet the requirements of the inspection, the illumination shall be not less than 50 foot candles.

Ventilation

2. Adequate means for ventilation must be provided in workrooms and welfare rooms. This may be furnished by means of ventilating-type windows, skylights, or both, or by mechanical means such as air conditioning or a fan-and-duct system. In locations subject to dust and objectionable odors windows should be the fixed type. In refrigerated workrooms where natural ventilation is limited and where a considerable number of operatives are continuously employed, as in large cutting and boning rooms and bacon-slicing rooms, a reasonable amount of mechanical ventilation with fresh air must be continuously supplied to prevent stagnation of air.

Fresh air intakes for workrooms and welfare rooms shall be so located that the air is not contaminated with odors, dust, smoke, etc. The intakes must be provided with effective filters to eliminate insects, dust, etc., and where indicated, a heating element for tempering the air in cold weather should be provided. Mechanical ventilating systems for nonrefrigerated work areas and welfare rooms that depend entirely on artificial means of ventilation shall have ample capacity to produce at least six complete air changes hourly.

Refrigeration

3. Sufficient refrigerated space must be provided to handle product properly. A temperature not higher than 50° F. shall be maintained in such areas.

The type of refrigeration shall be indicated on the drawings. If wall coils are installed, a drip gutter of concrete or other impervious material integral with the floor and properly connected with the drainage system shall be provided beneath the

coils. If overhead refrigerating facilities are installed, insulated drip pans properly connected to the drainage system shall be placed beneath them. Floor-type refrigerating units must be placed within curbed and separately drained areas unless located adjacent to floor drains.

Equipment

1. Equipment must be constructed so that it can be readily kept clean. All surfaces contacting product shall be smooth, free from pits, crevices, and scale.

Acceptable Materials

2. Excepting such equipment as cutting boards, equipment must be constructed either of rust-resisting metal, such as 18-8 (300 series) stainless steel, or of plastic approved by the Meat Inspection Division. Galvanized metal, although acceptable in certain equipment, is not desirable because it is not adequately resistant to the corrosive action of food products and cleaning compounds. When used, galvanized metal must have the smoothness of high quality commercial hot dip.

Nonacceptable Materials

3. (a) Copper and its usual alloys are not acceptable in equipment used in connection with edible product.

(b) Cadmium is not acceptable in any manner or form in equipment used for handling edible product.

(c) Lead must not be used in equipment contacting edible product, except that it may be employed in dairy solder in an amount not to exceed 5 percent.

(d) Equipment with painted surfaces in the product zone is not acceptable.

(e) The use of containers or equipment made of enamelware or porcelain is not acceptable for any purpose in connection with the handling and processing of product.

Plastics and Resins

4. Plastic materials and resinous coatings must be abrasion- and heat-resistant, shatterproof, nontoxic, and shall not contain a constituent that will migrate to meat or meat product in contact with the material. Such materials must be approved by the Division's Chemical Control laboratory in Washington before use.

Gaskets and Packings

5. All gasketing and packing materials must be nontoxic, nonporous, nonabsorbent, and unaffected by food products and cleaning compounds. Such materials shall be installed in a manner resulting in a true fit to prevent protrusion of the materials into the product zone or creation of recesses or ledges at the gasketed joints.

Design And Construction Of Equipment

Product Zone

Accessibility for Cleaning

1. All parts of the product zone must be readily accessible to sight and reach for cleaning and inspection.

Provisions for Dismantling

2. Where necessary for proper cleaning and inspection, equipment must be easily demountable. To facilitate this dismantling, quick opening devices that require no tools or, at most, such simple tools as a mallet and an open-end wrench shall be provided. Bayonet joints, butterfly clamps, spring bolts, and other similar devices are desirable for connecting or closing parts of equipment. Where parts must be retained by nuts and bolts, the design shall provide for fixed studs with wing nuts, rather than bolts to a tapped hole.

Bearings

3. All bearings must be located outside the product zone and if adjacent thereto must be constructed with a readily removable seal at the entrance of the shaft into the product zone.

Interior Corners

4. Interior corners of equipment must be provided with radii (minimum $\frac{1}{4}$ inch), except where greater radii are required to facilitate drainage and cleaning.

Welded Joints

5. All welding within the product zone must be continuous, smooth, even, and relatively flush with the adjacent surfaces.

Freedom from Cracks, Recesses, Ledges, and the Like

6. All parts of the product zone must be free of recesses, open seams and gaps, crevices, protruding ledges, inside threads, inside shoulders, inside bolts or rivets, and dead ends.

Self-Draining Equipment

7. Where necessary for sanitary maintenance, equipment must be constructed and installed so as to be completely self-draining.

Lubricants

8. Care must be taken to prevent contaminating product by lubricants used in overhead motors, gears, and similar devices. If drip pans are necessary to provide such protection, they shall be easily accessible for inspection and removable for cleaning.

Pumps and Pipelines

9. Pumps and pipelines used in connection with edible product (including edible brine or vinegar solutions) shall be constructed of 18-8 type stainless steel or approved plastic.

Nonproduct Zone

Safety Guards

1. All safety or gear guards must be readily removable for cleaning and inspection.

External Surfaces

2. All external surfaces that do not contact food product shall be free of open seams, gaps, crevices, and inaccessible recesses.

Equipment Installation

Spacing from Walls and Ceilings

1. All parts of stationary or not readily movable equipment must be installed away from wall and ceiling areas (minimum 1 foot) to provide access for cleaning and inspection.

Spacing Above Floor

2. All permanently mounted equipment must either be installed sufficiently above the floor (minimum 1 foot) to provide access for cleaning and inspection or be completely sealed (watertight) to the floor area.

Wall-Mounted Facilities

3. Wall-mounted cabinets and electrical connections (such as switch boxes, electrical control panels, and BX cables) must either be installed at least 1 inch from equipment or walls or be completely sealed to the equipment or walls.

Control of Waste Water

4. Water-wasting equipment, such as soaking and cooking vats, sausage stuffing tables, can sterilizers, and casing preparation equipment, shall be installed so that waste water from each unit is delivered through an interrupted connection into the drainage system without flowing over the floor. Valves on drainage lines serving such equipment shall be a type easily cleaned and must be mounted flush with the bottom of the equipment. Soaking and cooking vats should be provided with overflow pipes at least 2 inches in diameter. The upper end of each overflow pipe should be equipped with an open-end cleanout tee to facilitate cleaning.

Vent Stacks from Hoods

5. Vent stacks from covered cooking vats or hoods over cook tanks shall be so arranged or constructed as to preclude drainage of condensate back into the vats.

Height of Work Tables

6. Working surfaces of tables and other equipment should be not more than 34 inches above the floor where employees stand on the floor to conduct operations. Tables and equipment having higher working surfaces shall be provided with suitable metal foot platforms for employees to stand on.

Water on Work Tables

7. All tables or other equipment having water on the working surface shall be provided with turned-up edges. The height of the turned-up edge depends on the volume of water used and the operations conducted. In no instance should the turnup be less than 1 inch.

Cutting and Boning Boards and Tables

8. Boards used on boning and cutting tables shall be either a solid (unlaminated) piece of hardwood or (preferably) constructed of approved plastic. Boards shall be in the shortest sections practical and easily removable for cleaning.

Equipment Washroom

9. A separate washroom or area shall be provided in a location convenient to the department involved for cleaning curing vats, handtrucks, utensils, and containers such as boxes and trays. The room or area must have adequate light and ventilation, impervious well-drained floor, impervious walls and ceiling, and an exhaust fan for dispelling steam vapors. In plants using cages or trees for smoking sausage or other product facilities for washing and rinsing such equipment are required.

Hand-Washing Facilities, Sterilizers, Drinking Fountains, And Connections For Cleanup Hoses

Lavatories

1. Conveniently located hand-washing facilities (lavatories) with a minimum bowl size of 16 by 16 by 9 inches shall be provided for the employees and inspectors. Each lavatory must be supplied with hot and cold running water delivered through a combination mixing faucet with outlet about 12 inches above the rim of the bowl to facilitate washing arms as well as hands; liquid soap and an ample supply of sanitary towels in suitable dispensers; and a suitable receptacle for used towels. Lavatories in workrooms and welfare rooms shall be pedal operated. One lavatory shall be provided for every two sausage stuffing tables and they shall be so located as to be convenient to the stuffer operators. Lavatories shall be directly connected to the drainage system.

Sterilizers

2. Sterilizers shall be constructed of rust-resistant metal, and shall be of sufficient size for complete immersion of knives, cleavers, saws and other implements in scalding hot water. They should adjoin the lavatories in beef boning departments and elsewhere as required. Each sterilizing receptacle must be provided with a water line, a steam line or other means of heating, an overflow, and facilities for completely emptying the receptacle.

Drinking Fountains

3. Sanitary drinking fountains shall be provided in large workrooms and in dressing rooms. If desired, they may be located at lavatories and so arranged that the overflows discharge into the bowls of the lavatories. If so located, they shall be placed sufficiently high above the bowls to avoid splash onto them when the lavatories are used.

Hose Connections

4. Adequate and conveniently located hose connections for cleanup purposes shall be provided throughout the plant. The use of long hoses should be avoided. Suitable racks or reels for storing the hose when not in use must be provided.

Location of Facilities

5. The location of lavatories, lavatory-sterilizers, drinking fountains, and other similar features must be shown on the drawings.

Facilities For Processing Edible Product

Size of Departments

1. Meat preparation and processing departments shall be of sufficient size to permit the installation of all necessary equipment with ample space for plant operatives and truckways.

Flow of Operations

2. For efficiency, the processing departments should be arranged so that there is a proper flow of product without undue congestion or backtracking, from the time raw materials and supplies are received until the finished product is shipped from the plant.

Perishable Product Departments

3. Facilities for holding perishable product under refrigeration shall be provided. For proper care of product and to facilitate control of molds and bacteria, operations such as beef boning and trimming, bacon slicing, pork cutting, frozen steak preparation, and sausage chopping and mixing shall be conducted in departments having a temperature not higher than 50° F. Such operations must be located in rooms separate from carcass or product holding coolers to avoid contamination of product by cleanup water or condensation during the cleanup time.

Freezers

4. Product labeled "frozen" is required to be frozen in the establishment where prepared. Suitable freezing facilities shall, therefore, be provided in all establishments contemplating the preparation of "frozen foods."

Incubation Room for Sterile Canned Product

5. An incubation room for incubating samples of fully processed canned meat product shall be provided in a suitable location in all plants where regular canning operations are conducted. The room must be of adequate size for holding not less than 1 percent of fully processed canned product from each run of each retort for at least 10 days. The temperature in the room shall be maintained by thermostatic control at approximately 98°F., and the room shall be provided with a 7-day recording thermometer mounted on the outside wall of the room. The sensitive elements of the thermostat and recording thermometer must be below the bottom shelf. The shelves shall be made of expanded metal or heavy gage (No. 9) wire mesh and so installed as to be removable for cleaning. The floor in the room shall be pitched to a floor drain equipped with a removable metal screw plug. The door of the room shall be equipped for locking with an MID padlock.

Identification of Canned Product

6. In plants that conduct canning operations, tags that change color on heating must be provided for attachment to retort baskets containing canned product being placed in retorts for processing. Such tags shall be designed to positively identify cooked and uncooked product.

Dry Storage Space for Supplies

7. Suitable and adequate space for holding supplies such as boxes, paper, and cans shall be provided in a convenient location in each plant. In establishments that slice bacon, slice and prepackage luncheon meat, prepare sandwich steaks, and the like, and use a large volume of packaging and labeling material, adequate dry storage space shall be provided for holding such supplies in a location or locations convenient to the department where used, preferably immediately adjacent. Provisions must be made to store supplies on racks about 12 inches above the floor.

Truckways Within the Plant

8. Truckways shall be unobstructed passageways having a minimum width of 5 feet with no overhead storage rails. When truckways

are in coolers having overhead rails, along a wall or adjacent boning tables, a horizontal distance of 7 feet must be provided between the wall or table and the vertical of the nearest rail. Truckways shall be clearly designated on the drawings.

Vehicular Areas for Trucks and Railroad Track Gutters

9. Concrete-paved areas, properly drained and extending out at least 20 feet from buildings, loading docks, or platforms, must be provided at places where vehicles are loaded or unloaded. Railroad track gutters with suitable drainage shall be provided where refrigerated railroad cars are loaded and unloaded. The top of the gutter must be below the bottom of the railroad ties unless the entire track area is paved. This feature should be clearly illustrated on the drawings by a typical cross section of the gutter and adjacent railroad ties and rails.

Chilling Coolers

Rail Arrangement

1. Cooler rails shall be placed at least 2 feet from refrigerating equipment, walls, columns, and other fixed parts of the building. To promote cleanliness of product and to protect walls from damage by carcass shanks, it is desirable to place rails (especially header or traffic rails) at least 3 feet from the walls.

Height of Cooler Rails

2. The tops of cooler rails above the highest part of the floor shall be at least $7\frac{1}{2}$ feet for sausage cages; 9 feet for headless hog carcasses and calves (trolleys 12 inches long); and $7\frac{1}{2}$ feet for quarters of beef. Sheep and goat carcasses shall be suspended so that the hooks or gambrels are at least $6\frac{1}{2}$ feet above the floor.

Retaining Compartment

3. A suitable compartment shall be provided in a cooler for holding retained products. The compartment may be separated from the remainder of the cooler by partitions of rust-resistant wire screen (No. 9 gage, 1-inch mesh), or flat expanded metal of approximate gage and mesh, extending from about 2 inches above the floor to the ceiling. The compartment shall have a door of similar material at least 4 feet wide, equipped for sealing or locking with an MID padlock.

Welfare Facilities For Plant Employees

Dressing Rooms and Equipment

1. Well located dressing rooms, properly separated from toilet rooms (see paragraph number 4 below), are required for employees of each sex (unless only one sex is employed at the plant). The number of employees using each dressing room should be shown in the drawings or specifications. If multiple shifts of employees working in the plant use the facilities, this should also be indicated in the plans.

Lockers

2. Each employee shall be provided with a metal locker at least 15 by 18 by 60 inches. To permit ready cleaning beneath the lockers, they must be placed above the floor on legs or other supports about 16 inches high. The lockers shall have sloping tops. To facilitate orderliness and cleaning of the dressing room, employee seats should be in the form of plastic or wood planks about 12 inches wide, mounted in front of and below the doors of the lockers on an extension of the framework supporting the lockers. If seats not attached to the lockers are preferred, they must be in the form of plastic or wooden planks securely fastened by means of a minimum number of pipe leg supports to the floor in the aisle between the lockers. The aisle width between rows of lockers shall be about 7 feet minimum when attached seats are used (5 feet between rows of seats) and about 6 feet minimum with centrally located seats.

Toilet Rooms and Facilities

3. Toilet rooms must be separated from adjoining dressing rooms by tight, full-height walls or partitions. Toilet rooms may not be entered directly from a workroom, but entrance through an intervening dressing room or ventilated toilet room vestibule is permissible. Toilet rooms and toilet room vestibules shall have solid self-closing doors completely filling the openings, except as described in paragraph 7.

4. Elongated water closets with open split seats shall be provided in sufficient number for the employees using them (at least one unit for 25 men or 20 women). It is desirable to provide urinals in toilet rooms for men. If stall-type urinals are used, a step-up of concrete or other impervious material surfaced with ceramic or glazed tile, sloped to drain into the urinals must be provided. If wall-hung type urinals are used, floor drains shall be provided immediately beneath such fixtures.

Hand-Washing Facilities in Welfare Rooms

5. A sufficient number of modern-type hand-washing basins (lavatories) are required in welfare rooms. In small plants with a limited number of employees, lavatories in welfare areas may be confined to toilet rooms. However, large dressing rooms should have hand-washing facilities in addition to those located in the toilet rooms.

Ventilation of Welfare Rooms

6. Inside toilet and dressing rooms without means for admitting natural light and ventilation and not air-conditioned, must be effectively ventilated mechanically. Such inside toilet rooms shall be provided with an exhaust fan (activated by a common switch with the artificial lighting in the area) and a duct leading to the outside air. Doors to dressing and toilet rooms ventilated in this fashion shall have a louvered section about 12 by 12 inches minimum in the lower panel.

Lunch Facilities

7. To preclude insanitary conditions usually associated with employees eating lunches in edible processing departments, adequate lunch facilities consisting of tables and chairs (or benches), a lavatory, and drinking fountain must be provided when plant cafeterias or nearby eating places are not available. If dressing rooms have sufficient space without congestion, no objection will be made to providing the lunch facilities in such areas. Otherwise, a separate room or area is required.

MID Inspector's Office

1. A well-located inspector's office at least 7 by 9 feet in size is required at each official establishment. The office shall be located so that it is not entered through a company office or employees' welfare facilities. It must be supplied with suitable furniture, including a desk and chairs, a metal clothing locker for each Government employee, a metal cabinet equipped with a lock for the storage of supplies, and lavatory facilities. Shower-bath facilities, while desirable, are not required in inspector's quarters at establishments where only processing operations are conducted. Separate toilet room and adequate dressing room facilities must be provided in the inspector's quarters at establishments of such size that the assignment of several inspectors is required.

APPENDIX

Suggested Notes Or Specifications To Accompany Drawings

Building Contruction

1. Portland cement plaster is used wherever the words "Cement Plaster" or the letters "P.C." appear on the drawings.
2. All walls are surfaced with an impervious material as indicated on the drawings for each room or area.
3. All floors having drainage facilities are of brick or concrete and sloped about $\frac{1}{4}$ inch per foot to floor drains. Floors where operations are conducted have a nonslip surface.
4. Ceilings are smooth and flat and have a smooth, impervious surface as indicated on the drawings for each room or area. If there are exposed joists or rafters in the ceilings, they are of dressed lumber or rust-resistant metal and are spaced 36 inches or more on centers.
5. Dressed lumber is used for all exposed interior woodwork.
6. All exposed wood surfaces are painted with a good grade of oil or approved plastic paint or treated with hot linseed oil or a clear wood sealer.
7. All window and door openings and other openings that would admit flies are provided with effective insect screens or fly chaser fans. Also, effective means are provided to preclude rodents from entering buildings.
8. Glass in windows and skylights has a high transmissibility of light. Effective measures, such as the use of heat absorbing glass, glass block, or monitors and sawtooth skylights with sash facing north, are taken in workrooms to avoid objectionable heat and glare from the sun's rays during the summer season.
9. Rails are placed not less than 2 feet from walls, posts, and other fixed parts of the building. Header rails are spaced at least 3 feet from adjacent walls and columns.
10. A retaining compartment for product, constructed of rust-resistant No. 9 gage wire partitions or expanded metal of approximate gage, about 1-inch mesh, extending from about 2 inches

above the floor to the ceiling, is provided in a cooler as indicated on the drawings. The door of this compartment is of similar material and is equipped for locking with an MID padlock or seal.

11. All doors of toilet rooms and dressing rooms and toilet room vestibules are solid, self-closing, and completely fill the openings, except as otherwise shown on the drawings.

12. All inside window ledges are sloped about 45° .

13. Doorways through which products are transferred on rails or in handtrucks are at least 5 feet wide, or in the case of doorways through which 11 feet or higher rails pass, at least $4\frac{1}{2}$ feet wide.

14. Doors are of rust-resistant metal, or in case of cooler doors of wood construction, they are clad on both sides with heavy rust-resistant metal and any seams are soldered or welded. The juncture of metal clad door jambs and the walls are effectively sealed with a flexible sealing compound.

15. Glass blocks used in wall panels, etc., have smooth exposed surfaces.

16. Suitable coves to facilitate sanitary maintenance are provided at junctions between walls and floors.

17. Stairs are of impervious material and have solid treads, closed risers and side curbs 6 inches high measured at the front edge of the step.

18. Floor openings for chutes, etc., and for stairways except at entrances have curbs of impervious material, such as concrete or metal, at least 12 inches high to exclude floor drainage.

19. Effective means, such as expanded metal or wire with a mesh not exceeding $\frac{1}{2}$ inch embedded in the walls and floors at their junctions and extending vertically and horizontally an adequate distance, or other effective means, are provided to exclude the entrance of rats and other rodents into rooms.

Water Supply, Plumbing, Drainage, and Refrigeration

1. The potable water supply is obtained from (indicate source of supply, e.g., wells, City of _____), and is effectively protected from pollution.

2. An ample supply of hot water at adequate temperature and under suitable pressure and properly distributed throughout the plant is provided. Hose connections for supplying hot and cold water are provided in the various workrooms at the approximate locations shown on the drawings.

3. Each lavatory (hand-washing basin) is supplied with hot and cold water delivered through a combination mixing faucet with outlet about 12 inches above the rim of the bowl, liquid soap and an adequate supply of sanitary towels in suitable dispensers, and a suitable receptacle for used towels. Lavatories are pedal operated.

4. Sanitary drinking fountains are provided in the processing departments and in the dressing rooms. If placed adjoining a lavatory, they are located high enough to avoid splash from the lavatory.

5. All equipment wasting water is installed so that waste water is delivered into the drainage system without flowing over the floor. Drainage from edible products handling equipment such as sausage tables, cook tanks, etc., is delivered to the drainage system by means of individually interrupted connections.

6. Effective means are taken to prevent back-siphonage of liquids into the potable water supply or steam lines. Back-siphonage of liquids into potable water supply is prevented by placing water lines to equipment such as cooking or soaking vats and the like, higher than the highest level reached by liquids in the vats, etc.

7. The sewage from the plant is discharged into the city sewer system (furnish description of facilities if other method of disposal is employed).

8. Toilet soil lines are separate from house drainage lines to a point outside of the building and bypass the grease catch basin (if there is one at the plant).

9. Floor drainage lines inside buildings are of metal and have an inside diameter of at least 4 inches, properly vented to the outside air to a point above the roof. Each drainage inlet is equipped with a deep seal trap. All floor drains and vent lines are provided with facilities to exclude rodents.

10. The grease catch basin is not located in or near an edible department and is constructed so that it can be completely drained of its contents for cleaning daily and is without cover for ready

inspection. Grease skimmed from the basin is (placed in water-tight containers and promptly removed from the plant) (blown to inedible processing equipment in the plant). Use appropriate statement. A hose connection for supplying hot water for cleaning the basin and adjacent area is provided in a convenient location. The area around the basin is paved with concrete and provided with drainage facilities. The location and construction of the basin is shown on detailed drawing.

11. Heat to dispel steam and vapor is provided in unrefrigerated workrooms.

12. Refrigerated rooms are maintained at a temperature not higher than 50° F.

13. The coolers are refrigerated by means of (select appropriate statement below) (a) Overhead refrigerating units with insulated drip pans beneath them, properly connected to the drainage system. (b) Floor-type refrigerating units placed within curbed and separately drained area unless located adjacent to floor drains. (c) Wall refrigerating coils with drip gutters of impervious material, such as concrete, beneath them, properly connected to the drainage system.

Equipment

1. All equipment is designed, constructed, and located in strict conformity with standards given on pages 14 to 18 in U. S. Inspected Meat Processing Plants (No Slaughtering).

2. Chutes for the transfer of product are so constructed that they can be readily cleaned (long chutes, due to difficulty of cleaning, should be avoided). Chutes are round in shape or otherwise have well-rounded corners. Chutes leading from edible to inedible products departments are effectively hooded and vented.

3. Cooking vats and like equipment are provided with overflow pipes at least 2 inches in diameter having open-end cleanout tees at their upper ends and are connected to the drainage system by means of interrupted drains. Valves on drainage lines leading from such equipment are located flush with bottom of equipment.

4. Curing containers are constructed of stainless steel or MID approved plastics.

5. Pipelines and pumps used in connection with edible product (including edible brine and pickling solutions) are demountable and made of stainless steel or MID approved plastics.

6. The cages or trees used for smoked meats and sausage are so designed that there is a clearance of at least 12 inches between the product and the floor of the smokehouses and hanging rooms. The type and size of this equipment is illustrated by detail drawings on Sheet No. _____. (Insert correct sheet No. of submitted drawings.)

7. Smoke-making equipment, ducts, and smokehouses are so located and designed that all outer and inner surfaces can be readily cleaned.

8. Color changing tags are provided and attached to retort baskets to identify product that has been retorted.

9. A suitable room or separately drained area is provided for washing handtrucks, boxes, trays, demountable parts of sausage stuffing equipment, etc. Two suitable compartments with entrance rails are provided for washing smokehouse cages and trees. The first compartment is used for washing cages and trees with a detergent solution and the second for rinsing this equipment with clean water to remove all detergent solution. The washing compartment has a suitable exhaust duct extending to a point outside of the building.

10. An incubation room for incubating samples of fully processed canned meat product is provided as shown on the drawings. The room is of adequate size for holding not less than 1 percent of fully processed canned product from each run of each retort for at least 10 days. The temperature in the room is maintained by thermostatic control at approximately 98°F., and the room is provided with a 7-day recording thermometer located on an outside wall so as to be visible from outside the room. The shelves are made of expanded metal and are removable. The sensitive elements of the thermostat and recording thermometer are below the bottom shelf. The floor in the room is pitched to a floor drain equipped with a removable screw plug. The door of the room is equipped for locking with an MID padlock or seal.

11. A suitable rust-resistant metal table with top about 3 by 5 feet is provided in an unobstructed space in a cooler for holding returned product for inspection.

12. Each employee is provided with a metal locker at least 15 by 18 by 60 inches, having a sloping top and with bottom elevated on legs about 16 inches long. Removable plastic or wood seats about 12 inches wide are provided in front of and below the doors of the lockers and are attached to the framework of lockers (or, a single plastic or wooden seat about 12 inches wide securely

attached to the floor by a minimum number of pipe leg supports is located about $2\frac{1}{2}$ feet in front of the lockers). The dressing room will be used by not more than (give number and sex of employees).

13. Clothing lockers have effective means for ventilation, such as doors having louvered openings of adequate size or doors constructed of expanded metal or heavy wire mesh.

14. The inspector's office is provided with suitable furniture, including a desk and chairs, a metal clothing locker (at least as large as that provided for employees) for each inspector, a metal cabinet equipped with a lock for the storage of supplies, and lavatory and toilet facilities.

15. A suitable room or space for the storage of supplies, such as wrapping paper, cartons and containers, is provided in a convenient location as shown. All supplies are placed on racks 12 inches above the floor.

Operations

1. Condemned and inedible material is transferred to the inedible products department in suitable watertight metal containers (for processing therein) (and removed from the plant daily, or oftener if deemed necessary by the inspector in charge, to an outside rendering plant for disposal). Use appropriate statement. Suitable facilities for washing the containers used for such materials are provided.

2. Empty cans are washed in an inverted position with water having a temperature of at least 180° F. or cleaned by an approved jet-vacuum device immediately before filling. If hot water is used for cleaning, an easily read dial-type thermometer is provided in the hot water line of the sterilizer.

3. Retorts are charged by (describe means). Retorts drain into curbed and drained areas or pits or are connected to the drainage system by interrupted drains.

4. Sausage material grinding and chopping, bacon slicing, boning, cutting, and similar operations are conducted in departments having a temperature of approximately 50° F. Such departments are not located in areas where hanging carcasses or exposed product are stored.

5. Pieces of meat are washed individually under running water and not in batches.

6. Vegetables are stored in bulk in a suitable separate room and are handled so as to avoid dissemination of dust. Suitable facilities for the preliminary preparation of vegetables for use in product are provided in a location separate from the processing area. Vegetables such as celery and potatoes are thoroughly washed before being cut up as by dicing.

7. Sawdust is conveyed to and ashes are removed from smokehouses in metal containers having tight fitting lids (when necessary to go through processing departments).

General

1. Each workroom is provided with artificial lighting of good quality having an intensity of at least 20 foot candles for general illumination and at least 50 foot candles at places where inspections are performed and where plant operations require establishment employees to prepare products of any character to meet the inspection requirements.

2. Outer clothing of employees, shroud cloths, etc., are laundered at (the plant laundry) (an outside laundry). Use appropriate statement.

3. Roadways on the premises adjoining the plant are hard-surfaced and have a binder of asphalt, tar, or cement, and are properly drained. Vehicular loading and unloading areas adjacent to the plant are concrete paved and properly drained.

4. Wall-mounted cabinets, electrical control panels and the like have a clear space of at least 1 inch between the mounted units and the wall.

5. Artificial light fixtures in rooms where exposed meat is handled or processed are provided with a protective shield of suitable nonshattering material such as Plexiglas so as to preclude contamination of product with broken glass.



